Good Work Practice

Leaking Drum Identified, Contained in Safe and Efficient Manner

March 19, 2007 2007-RL-HNF-0012 Tracking No: 457

Summary:

Due to training and employee alertness, a leaking stored drum was identified and contained, in a safe and efficient manner.

Discussion of Activities:

On March 7, 2007, while performing surveillance, a Nuclear Chemical Operator noticed a small puddle of rust-colored liquid adjacent to a pallet of drums stored in the Central Waste Complex storage facility. The liquid had not been observed during the previous day's surveillance. Assuming he may have stepped in the liquid, the operator removed his shoes, remained in place, and called a Radiological Control Technician (RCT). The RCT performed a survey and found a non-reportable quantity of radiological contamination (24,000 dpm/100cm2 beta/gamma, no alpha) on one shoe. Personnel were surveyed out of the building.

Photo of Identified Leakage

The Operations Manager staffed the Incident Command Post (ICP) to address a possible hazardous waste spill. A recovery plan was developed to allow personnel to enter the building with appropriate Personnel Protective Equipment (PPE), in order to sample the material, mitigate the spill, and determine the source.

Pinholes on Bottom of 85 Gallon Overpack

Contamination and airborne surveys were conducted. The liquid had leaked from an overpacked waste drum (85 gallon outer drum) located on the bottom tier of a storage array. Sampling of the released liquid indicated an acid constituent (pH of 2). The spill was cleaned up and treated with an acid kit. Follow-up surveys found no additional contamination on the floor and personnel departed the building.

A recovery effort to contain the drum was initiated. Adjacent pallets and waste containers were moved away from the drum and no contamination was found. When tipped, corrosion was noted on the bottom of the overpack. The drum was bagged in plastic wrap with acid neutralizer and placed on a spill pallet. No further abnormal conditions were identified.

The inner 55 gallon container had been sent to the Low Level Burial Grounds in the 1970's, and had been retrieved in 2004. The overpack had been transferred to CWC in 2006. The leaking drum contained room waste from the Plutonium Finishing Plant. A review of the documented history provided no unique characteristics which would have contributed to the corrosion of the overpack drum. Waste Stabilization and Disposition is continuing to investigate this issue.

Analysis:

In this situation, there was a potential for contamination spread and/or personnel contamination. By immediately taking the right actions and by implementing a Recovery Plan, the consequences of the event were minimized.

Photo of Remediated Drum

Abnormal conditions can place personnel into a knowledge-based mode of response, where they rely on previous experience and similar events to determine what actions to take. Knowledge-based activities have the highest potential for human error, and can have the highest level of consequence if an error does occur. Training, operational and emergency drills and employee response can promote a prompt and effective response to an abnormal condition.

By staffing the incident command post, the Operations Manager had immediate access to subject matter experts. This aided in determining the possible contents of the leaking drum and in developing conservative recovery actions. Because limited historical information on the leaking drum was available, recovery planning considered the worst cases to identify potential hazards and determine how to mitigate them.

Information on the drum indicated it contained transuranic waste, which should have resulted in alpha contamination. Radiological surveys found less than detectable alpha contamination. Radiological controls for recovery were based on process knowledge as well as documented information on the drum.

Recommended Actions:

Review the potential for abnormal conditions in operations to determine if these potential conditions have been incorporated in training and drill programs. Promote the use of hands-on drills with simulated response to prepare personnel to respond to abnormal conditions.

Cost Savings/Avoidance: NA

Work Function: Material Handling, Storage

Hazards: Environmental Release, Hazardous Material

Keywords: leaking drum, hazardous waste storage, contamination, transuranic

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